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Bulk Distribution Of Lime By Selected Cooperatives In Three Southern States

(Kentucky, Mississippi, and Tennessee)

By B. H. Pentecost

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The Farmer Cooperative Service conducts research studies and service activities of assistance to farmers in connection with cooperatives engaged in marketing farm products, purchasing farm supplies, and supplying business services. The work of the Service relates to problems of management, organization, policies, financing, merchandising, product quality, costs, efficiency, and membership.

The Service publishes the results of such studies; confers and advises with officials of farmer cooperatives; and works with educational agencies, cooperatives, and others in the dissemination of information relating to cooperative principles and practices.

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SUMMARY AND SUGGESTIONS

This study obtained available information on cooperative lime distribution by 10 selected farm supply cooperatives in Kentucky, Mississippi and Tennessee. The major areas of interest were: (1) Size and type of service (2) type of equipment used (3) operating practices (4) costs of service and (5) possibilities for improving services to farmers.

Operating Highlights

* Most associations started liming operations to give patrons a needed service - which farmers in the area frequently demanded.

* Only one association distributed lime before 1945. Four associations had begun operations within the past 3 years, offering both distribution and spreading services from the beginning. The increasing number of cooperative lime distributors in recent years indicates that farmers are turning more to their cooperatives for this needed service.

* Size of the lime operations on a yearly basis varied from 1,200 to 9,500 tons, and averaged 5,833 tons among nine associations reporting. The dollar volume for eight of these associations ranged from $7,320 to $46,750, and averaged $26,500. All but one association studied spread 100 percent of the lime sold. That association spread 80 percent of its total volume. The average dollar volume of lime sold by eight reporting associations ranged from 3.3 to 30.8 percent of total supply volume, and averaged 9.9 percent.

* Only 3 of the 10 associations owned lime hauling and spreading equipment. Seven association operated on a contract basis with private truckers. One of these associations had previously owned two spreader trucks, but decided it was more economical to contract with private truckers. Managers of associations using the services of contract truckers generally believed that method of operation was best because of the seasonality of demand for lime.

* Two types of spreading equipment were used by the associations and contract truckers. One was operated by power take-off and the other was a combination power take-off and engine driven unit.

* No specific training in lime spreading operations was required of spreader truck drivers. However, most drivers were given some on-the-job training to familiarize them with the operation.

* Three associations were close enough to lime quarries to operate spreader trucks direct to the farm. The remaining associations used rail transportation for shipping lime to their yards and unloading areas. This involved extra cost and resulted in inconvenience and sometimes delay.

* Credit policies varied among the associations studied. One was on a strictly cash basis; one did not have a definite credit policy; and the remaining associations usually did not enforce their credit policies. Only one of the latter group reported no credit problems at the time of this study.

* The per ton charges for hauling and spreading lime ranged from \$1.25 to \$2.25, and averaged \$1.80. The rates charged, however, did not vary within counties.

* The cost of lime delivered to and spread on patrons' farms ranged from a low of \$2.50 a ton in a direct plant-to-farm operation to \$7.40 a ton in an operation involving rail transportation. The average cost of lime to patrons for all associations was \$5.32 a ton.

* Only 1 of the 10 managers believed that patrons were using enough lime on their soil and only 3 expected any change in the future use of lime by farmers. This indicates need for educational work with patrons in the use of lime. No changes in future lime services were planned by 8 of the 10 managers.

Suggestions for Improvement

The following suggestions should be helpful in providing more efficient service in lime distribution:

1. Improve service during rush seasons. Farm supply cooperatives have helped alleviate the problem of inadequate service in the areas covered in this study. Occasionally, however, delivery and spreading services did not meet the demand during rush seasons. The following suggestions should help improve this situation:

    a. Encourage farmers to learn more about the effects of early lime applications. Cooperatives might sponsor a demonstration project with one or more patrons to show that lime applied in September, or even in winter on frozen ground, is just as effective as when applied in spring just before the planting season. Cooperatives also could encourage farmer's to take early deliveries by offering a small discount for pre-or-off-season delivery orders. This should help distribute the work load over a longer period of time and the increase in volume of business should more than offset the discount. At the same time more patrons would benefit from the service.

    b. Cooperative managers, with the aid of county agents and leading farmers, should work closely with ASC committee members to point out the importance of submitting lime requests and recommendations early to avoid late clearance from program officials.

2. Keep adequate records. If cooperative managements are to know whether they are distributing lime efficiently, they should have separate and complete records on their liming operations. These records should include:

a. Initial cost and book value of trucks and equipment.

b. Costs involved in the various types of operations such as loading and unloading in stockpiling operations and transporting by rail.

c. Cost of wages, direct truck expenses including insurance and licenses, other expenses such as depreciation and interest, and a reasonable amount for administrative and general overhead expenses.

Two important items often overlooked are depreciation and interest.

By keeping accurate and separate records on liming operations, management could determine whether or not the operation is economical in relation to other alternatives. These records would be useful for making a comparative analysis of contracting with equipment owners versus cooperatively owning equipment. Also, such comparisons would be useful to other associations planning to begin lime distributing services, and for associations already operating and planning to expand present operations.

3. Use written contracts to help avoid misunderstandings. Only three associations were using, or planned to use, written contracts in dealing with individual truckers. Although none of the remaining associations contracting with truckers had experienced any problems, it would probably be best for all parties concerned to have a written agreement. A simple, clearly written agreement would help avoid misunderstandings and ill feelings.

4. Supply patrons with more information on soil fertility. There is a lack of education in the area of soil fertility. Cooperative managers could encourage member-patrons to attend agricultural meetings when possible, to talk to their county agents, and to read State experiment station publications and agricultural papers to learn more about managing their soils. Although a soil testing service is available through most county agents, some cooperatives are also offering this service to advantage without cost to the patron.

By promoting more educational work in lime use, managers could increase their lime volume and at the same time provide better service to farmers.

BULK DISTRIBUTION OF LIME
BY SELECTED COOPERATIVES IN THREE SOUTHERN STATES

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Climatic conditions over much of the South are conducive to leaching, a continuous process which removes lime reserves from the soil. Therefore, liming in most areas is one of the first major steps toward more efficient farming.

As a result of years of research, present day liming practices can be based on established facts rather than on hunches or guesses. Relatively small amounts of lime were used prior to World War II; but trends since that time have shown that an increasing number of farmers are recognizing the importance of lime use.

According to the 1954 census of agriculture, 28,026 Kentucky farms reported 1,084,810 tons of lime, valued at $3,072,574, used on 593,959 acres of land. In Tennessee 10,325 farms reported 232,451 tons, valued at $773,980, used on 144,600 acres; while 6,337 farms in Mississippi reported 216,825 acres limed with 186,118 tons, valued at $1,009,000. The average amounts of lime used per farm were 38.7 tons, 22.5 tons, and 29.4 tons in Kentucky, Tennessee, and Mississippi, respectively. The average amounts used per acre were 1.8, 1.6, and 0.9 tons in these respective States.

Although a large number of farmers in these States realize the importance of lime use, many farmers in the South still do not use lime on their farms because they are not aware of its value. Other farmers who are better informed about soil fertility would use more, but cannot always get the amounts they want when they need it. This may be due to a lack of available spreading service, a poor source of supply, or other conditions beyond their control.

The average farmer cannot afford to own expensive liming equipment for a short period of use each year, and outside services are often limited and overworked during rush seasons. This situation has been somewhat alleviated in many areas by farm supply cooperatives. As a result, an increasing number of farmers have turned to their cooperatives for lime distribution and spreading services.

Note: The writer wishes to express appreciation to J. Warren Mather, Chief Farm Supplies Branch, Farmer Cooperative Service, for helpful suggestions and assistance during preparation of this manuscript.

Nine farmer cooperatives in this study, reporting a full year's sales for the 1958 fiscal year, sold 52,500 tons of lime to patrons, or an average of 5,833 tons per association. The total value of lime sold was $212,009, averaging $26,500 per association. This is indicative of the important role farmer cooperatives are playing in lime distribution in these areas.

PURPOSE AND METHOD OF STUDY

This study was undertaken to obtain information on cooperative lime distribution and spreading services offered by 10 selected farm supply cooperatives in the South. The major areas of consideration were: (1) Size and type of service; (2) equipment used; (3) operating practices (4) costs of service; and (5) possibilities for improving services to farmers.

This report should be of use to farm supply cooperatives considering a bulk lime distribution and spreading service for patrons. Also, it should help associations already performing such services to improve their operating efficiency and future services.

Cooperatives selected for this study were located as follows: Three in Kentucky, six in Mississippi, and one in Tennessee. Operating conditions in Kentucky were different than in the other two States because the cooperatives were located near enough to quarries for direct plant-to-farm operations. 1/ Most of the remaining associations were too far from their source of supply for this type of operation and, therefore, required transportation facilities other than spreader trucks to get the material to the area of distribution. This latter type of operation often presents problems involving extra cost and delays.

Data on operating practices, costs of service, and equipment were obtained by personal interviews with 10 local farm supply managers. In many instances, adequate data for operations pertaining to lime were not available. In most of these cases, truckers who contracted to haul lime kept little or no written records, and those associations who owned their equipment often did not keep separate records on liming operations.

HISTORY AND DEVELOPMENT

Of the 10 associations studied, only 1 operated a lime distribution service to patrons prior to 1945. This association was formed in 1934 by local farmers. It was originally an agricultural limestone quarrying cooperative. However, in the early 1940's other commercial lime companies moved into the area and by 1949 the cooperative had ceased quarrying operations, but continued distributing and spreading lime and fertilizer.

1/ Quarry and plant are used interchangeably in this report.

Four of the 10 associations began distributing lime near the end and just after World War II, 1 association began in 1950, and the remaining 4 began such operations after 1956.

Three associations started offering spreading services within 2 to 3 years after they first began distributing lime. One did not offer the complete service until 13 years later. However, all of the five associations formed after 1949 started their operations by offering patrons a complete distribution service of hauling to and spreading on the farm.

The primary reason reported by most managers of the selected cooperatives for starting lime distributing operations was to give patrons a needed service. Others, however, reported that demands from patrons caused their cooperatives to enter the lime business. One manager stated that the cooperative he managed did not go into the lime business with the expectation of making significant savings; rather it believed that offering the badly needed service would increase the overall business of the association.

Table 1. - Lime sold and spread, number of lime patrons, and average sales per patron, nine selected farm supply cooperatives, Kentucky, Mississippi, and Tennessee, 1958 [1]

Association number	Lime sold		Lime spread	Approximate number of lime patrons	Average sales per patron
	Tons		Tons		Tons
1	5,366	$39,975	5,366	200	26.8
2	1,200	7,320	1,200	200	6.0
3	8,500	46,750	8,500	300	28.3
4	4,000	[2]	4,000	200	20.0
6	1,748	11,360	1,748	150	11.7
7	6,386	32,174	6,386	250	25.5
8	9,000	30,960	7,200	500	18.0
9	6,800	19,720	6,800	350	19.4
10	4,500	22,750	9,500	400	23.8
Average	5,833	26,500	5,633	283	20.6

[1] Information not available for one association (number 5).
[2] Information not available.

SIZE AND TYPE OF SERVICE

This section deals with the volume of lime handled, type of service offered and problems involved, and various factors affecting size and type of service offered by the associations studied.

Size of Liming Operations

The volume of lime sold by nine associations reporting in the fiscal year 1958 ranged from 1,200 to 9,500 tons, and averaged 5,833 tons (table 1). Their lime sales ranged from $7,320 to $46,750, or an average of 26,500. The average number of lime patrons per association was estimated to be 283, and the average amount of lime bought per patron was about 21 tons.

As a percent of total dollar volume, lime ranged from 3.3 to 30.8 percent (table 2). The average sales of lime for the eight associations reporting was $26,500 or 9.9 percent of the average total sales of all farm supplies.

Nine of the associations studied delivered 100 percent of the lime sold to the farm, all of which was spread. The remaining association delivered and spread 80 percent. The 20 percent not delivered by this association was sold to patrons f.o.b. unloading dock or stockpile. Unloading and hauling arrangements were taken care of by each respective patron.

Type of Service and Problems Encountered

Two different methods of delivering and spreading lime were used. They were: (1) By the cooperatives' own spreader trucks, and (2) by contracting with individuals owning and operating spreader trucks

These two lime spreader trucks are owned and operated by a local cooperative.

Of the 10 associations studied, only 3 owned their trucks. Two of these each owned and operated two spreader trucks and one had three. The seven remaining associations operated their lime distribution and spreading services on a contract basis with individuals owning the equipment. These individuals agreed to accept all responsibility for demurrage and for damages to farms or other property caused in connection with liming operations. Managers generally believed that contracting with individuals was the best method of operation due to the seasonality of demand for lime. The heaviest demand for lime comes in the spring and fall and often weather conditions prevented full-time operation during these short periods. Owning idle equipment increases an association's operating expenses as well as the cost of lime to farmers; therefore, rather than have expensive equipment idly depreciating, the associations believed their capital could be used to a better advantage than in lime spreading facilities.

In most of the local lime distribution areas considered in this study, a lack of adequate services had been improved considerably by farm supply cooperatives providing delivery and spreading services. However, the use of both distribution methods did not prevent problems from arising.

Table 2. - Total supply volume, lime volume, and lime as a percent of total volume, eight selected farm supply cooperatives, Kentucky, Mississippi, and Tennessee, 1958 1/

Association number	Total supply volume	Lime volume	Lime as a percent of total
1	$501,400	$39,975	8.0
2	220,000 2/	7,320	3.3
3	335,000 2/	46,750	13.9
6	180,700	11,360	6.3
7	600,000	32,174	5.4
8	310,000	30,950	10.0
9	219,000	19,720	9.0
10	77,000	23,750	30.8
Average	267,700	26,500	9.9

1/ Information not available for associations number 4 and 5.

2/ Approximate total volume.

Occasionally during rush seasons there was a lack of delivery and spreading services to meet the demand. This was due to several reasons: (1) Many farmers believed that they should apply their lime only in the spring just before planting and this caused a flood of orders for delivery in a very short period of time; (2) extreme weather conditions during the spring or fall delayed operations and increased the rush when conditions became more favorable; and (3) farmers in most of the areas studied, purchased only the amounts of lime available through their county Agricultural Stabilization and Conservation Program. Some managers stated that sometimes clearance as to amount of payment through the program was delayed, thus resulting in a piling up of orders. This contributed to the rush by delaying early deliveries.

Through 1957 all cooperatives contracting with lime truckers used a verbal contract, but at least three associations had been faced with problems due to a lack of complete understanding of the contract terms. Therefore, at the time of the study they were using or planned to begin using, written contracts to avoid future problems.

Factors Influencing Farmers Use of Lime

Six of the 10 association managers reported that most farmers in their area used only the amounts of lime available from payments through their county Agricultural Stabilization and Conservation program (ASC). Three other associations reported that ASC payments had a big influence on the amounts of lime used in their areas; however, they also reported that farmers were becoming better educated in the use of lime and many were continuing to buy in excess of their ASC quotas. Only one association manager expressed an opinion that farmers in his area were using optimum amounts of lime. He believed that those farmers knew the value of lime and were using the amounts needed on their soils.

Nine association managers therefore were in agreement that not nearly enough lime was being used in their respective areas. In general, this was attributed to a lack of education in lime use.

One association reported taking an active part in soil testing. Containers and information sheets were furnished patrons and assistance in taking the sample was given upon request. The association also paid for the sample. The manager reported this service had been influntial in encouraging farmers to use more lime and had definitely helped increase lime sales.

Other Liming Services in the Areas

One association was serving an area with four other lime vendors. Inadequate service was not a problem in that area; however, pricing practices of competitors sometimes presented problems. There was only one other vendor in five of the areas studied. Of the remaining four associations distributing lime, three were the only vendors in their areas, and one was the only full-time vendor.

The type of service offered by all lime vendors was essentially the same -- that is, all offered a delivery and spreading service -- but the quality of service varied. For example, one association contracted with a trucking firm which operated around the clock during the rush seasons. In addition to using truck headlights, drivers had head lamps rigged on their hats to enable them to see better and therefore do a better job of night spreading. The quality of service in the remaining areas was not as good, however, and in some areas it was reported to be very poor.

Occasionally transient truckers had brought a few loads of lime into areas served by two of the associations studied, but their total volume was not enough to be significant in either area. In all other areas studied, the prices charged for services was about the same among all vendors.

EQUIPMENT USED

As mentioned, some cooperatives owned their lime hauling and spreading equipment while others contracted with individuals to perform this service. Under the contract arrangement, truckers furnished all equipment necessary for liming operations from time of unloading until spread on the farm.

Loading and Unloading Equipment

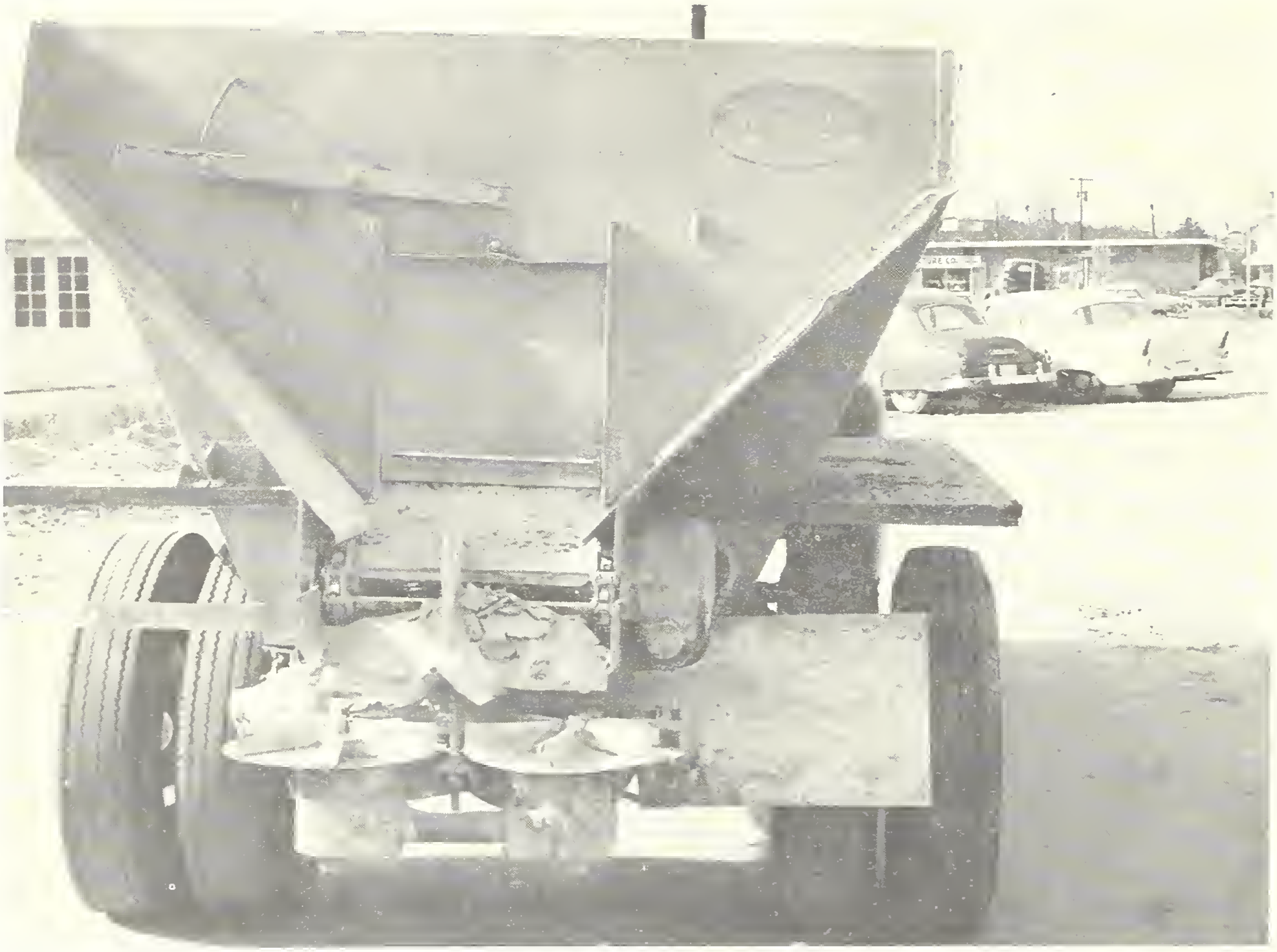
The principal types of unloading equipment used by contract truckers were: (1) conveyors, (2) power clams, and (3) front loaders for loading from stockpiles. One association had an ideal unloading arrangement which was fast and efficient, yet required no expensive loading equipment. It had built a sidetrack over an embankment in such a manner that trucks could back under hopper cars for gravity loading.

In direct plant-to-farm operations the lime was generally loaded on trucks by conveyors or by gravity from overhead storage bins.

Loading and unloading equipment varied considerably. One association which owned liming equipment used a conveyor for unloading lime from hopper cars. Another used a home-made rig consisting of an A-frame, an old pond scoop, cable, and an old truck for power. One association still used shovel wielding hand labor for loading the trucks.

Spreading Equipment

At the time of this study, associations and contract truckers were using two general types of spreading units on various truck makes. The spreader bodies all were constructed essentially the same with their capacities ranging from 6 to 10½ cubic yards. A convenient scale on the feed gate allowed accurate gate settings for rates lower than 1,000 pounds an acre; however, lime is seldom spread at less than this rate.



Feed gate settings can be adjusted accurately to desired amounts. A conveyor carries lime onto two twin spinners which spread lime uniformly.

The spreaders were powered two different ways: (1) By power-take-off (P.T.O.); and (2) by combination power-take-off and engine driven units.

Power-Take-Off Driven

Power-take-off units are available for installation on standard trucks. They were used in eight of the associations studied. Operating off the power-take-off, a large gear case drives a conveyor which carries lime out of the truck body onto twin spinners which uniformly spread lime over a wider area. The sides of the spreader body are deep and sloping which prevents spilling over the conveyor. In some models a removable inverted "V" section is installed over the conveyor to reduce heavy load pressure.

Combination Power-Take-Off and Engine Driven

The combination power-take-off and engine driven units were used by only 2 of the 10 associations studied. The leading manufacturers of spreading equipment recommend this type of unit especially for making heavier applications of lime. The conveyor belt operates off the power-take-off while an auxiliary engine mounted on the spreader body powers the spinners. The engine has a centrifugal clutch which automatically disengages when the engine idles, and engages when the engine reaches spreading speed.

OPERATING PRACTICES

The methods of procurement, areas served by spreader trucks, driver training, pricing, credit policies and accounting practices of the 10 selected cooperatives are discussed in this section.

Lime Procurement

The associations obtained their lime from nine different plants. The distance from the source of supply varied among the different associations. In Kentucky, quarries were located close enough for associations to operate spreader trucks direct to farms. However, truckers contracting with one association in Kentucky did some stockpiling in off-season. Other associations were having lime shipped in by rail from distances as far away as 400 miles. This not only increased the cost of distributing lime, but was also inconvenient. Of the nine different lime sources used by these associations, three were in Kentucky, two in Mississippi, two in Missouri, and one each in Alabama and Tennessee. One association bought lime from more than one source.

Only one manager reported any problems in procuring lime. Occasionally this association's main source of supply shut down operations temporarily which caused a slight delay in filling patrons orders on time. The other nine managers reported no procurement problems under normal conditions except for the distances involved.

Area Served By Spreader Trucks

Spreaders of the 10 associations studied usually serviced patrons located within a radius of 20 miles from the association's headquarters. However, distances varied with direction of delivery and in some cases lime was delivered as far away as 30 miles from the headquarters of the association.

Some of the associations that shipped lime in by rail had the cars delivered at different points in the county. By operating from more than one point the spreader trucks could service a larger area and at the same time operate more economically and conveniently by eliminating long distance deliveries.

Driver Training

None of the associations studied had any specific requirements concerning driver qualifications. However, many of the drivers had farm backgrounds and were familiar with farm conditions. Others had learned by experience, but to some spreading lime was just another job.

Farmers sometimes complained that drivers were careless and irresponsible. Most managers and truck owners, however, believed they could improve such situations by being more selective when hiring new drivers. Most new drivers were also given some on-the-job training until they became familiar with the operation of a spreader truck. According to most managers, drivers with farm backgrounds usually were more conscientious than those having little or no knowledge of the farm, and, therefore, usually made better employees for this type of work.

Pricing Policies

The pricing policies of the associations contracting with local truckers to deliver and spread lime to patrons were based on the cost of lime and the trucking charges. The cooperatives owning spreader trucks also priced lime according to costs and expenses. Under both arrangements these associations made an effort to keep prices in line with other firms providing lime services.

Credit Policies

One of the 10 associations reported it sold lime and other supplies only on a cash basis, one did not have a definite credit policy, and another association allowed patrons 30 days credit from the day of purchase. After 30 days, notices were sent out and if accounts were not paid within 60 days of date of purchase, further credit was refused.

The remaining seven associations had 30-day credit policies, but usually did not enforce them. Patron's credit approval was decided by the local managers and the directors, or both. Only one of these associations offering credit reported no credit problems at the time of this study.

Accounting Practices

Record keeping among the associations owning liming equipment needed improving. In purchasing equipment, management should have some basis for decision other than the fact that patrons need and desire the service. This is not to say that a cooperative should not attempt to meet the needs and desires of patrons; on the contrary, this is why cooperatives are formed. However, a cooperative is a business organization and if it is to succeed as such it must be operated according to good business practices. If an association fails as a business, it certainly cannot succeed in meeting the needs and desires of patrons.

Therefore, a cooperative manager should take into consideration the principle of opportunity costs when deciding whether or not to purchase any new equipment. The principle of opportunity costs simply means there may exist opportunities for more economical investments in other areas. Sometimes a co-op may be able to serve patrons best by using available capital elsewhere. In areas where contract truckers are available, it may be more economical to distribute lime through them rather than own expensive equipment. However, in order to make any of these decisions management should have separate and complete records on the cost of liming operations.

COST OF SERVICES

Both the cost of lime to cooperatives and to patrons and the cost of delivering and spreading lime are discussed in this section.

Cost of Lime to Cooperatives and to Patrons

The f.o.b. plant price paid for lime by 10 associations ranged from 75 cents to $1.50 a ton and averaged $1.07 (table 3). Freight costs paid by seven associations ranged from $1.50 to $3.52 a ton, or an average of $2.34. Three delivered lime direct from the quarry to the farm.

The total cost of lime to the patrons, including delivery and spreading, of 10 reporting associations ranged from $2.50 to $7.40 a ton and averaged $5.32 a ton.

Patrons of those associations located too far from the supply to haul lime direct to the farm were paying a much higher price, due largely to the additional freight cost.

The average total cost to patrons from the seven associations having lime shipped in was $6.17 a ton compared with $3.05 a ton for the three delivering direct from plant-to-farm. However, delivery and spreading charges were also less among the latter.

Disregarding freight cost there was little significant difference in total cost as compared to volume.

Gross margins realized by the cooperatives varied from 20 cents to $1.55 a ton, and averaged 68 cents a ton. The average gross margin for the seven associations where freight was involved was 78 cents compared with 47 cents a ton for those operating direct from plant-to-farm.

In a study conducted in 1955, consisting of 10 G.L.F. retail co-ops distributing lime, findings indicate somewhat higher costs than those found in this study (appendix table 3). In that study freight, too, was a big item, averaging $4.63 a ton. The trucking and spreading charges also were important, particularly for field spreading and direct plant-to-farm operations. The average charge for both trucking to the farm and spreading was $3.64 a ton compared with $1.80 for the associations in this study. The average G.L.F. store margin was 51 cents a ton bringing the average total charge to patrons to $7.67 a ton compared with $5.32 a ton by the associations in this study.

Delivery and Spreading Charges

The total per ton charges for lime delivered and spread on the farm ranged from $1.25 to $2.25, and averaged $1.78 a ton (table 4). Only 5 of the 10 associations allocated delivery and spreading charges separately. Their charges for delivery ranged from 75 cents to $1.00 a ton and their spreading charges ranged from 50 cents to 80 cents a ton. The charges for delivery and spreading did not vary with distance hauled or rate of application.

Table 3. - Costs of lime, delivered and spread to patrons in 10 farm supply cooperatives, Kentucky, Mississippi, and Tennessee, 1958

Association number	Price f.o.b. plant	Freight	Delivering and spreading	Cooperative gross margin	Total cost to patrons	Percent calcium carbonate in lime 1/
			Per ton			Percent
1	$0.75	$3.52	2/	2/	$7.40	95-98
2	1.45	1.96	$2.25	$0.44	6.10	90
3	.90	1.80	1.75	1.05	5.50	80
4 3/	.85	3.45	2.00	.45	6.75	95-98
	1.00	2.00	2.00	.50	5.50	80
5	.75	2.05	2.00	1.55	6.35	90
6	1.10	2.45	2.00	.95	6.50	90
7	1.50	1.50	1.75	.50	5.25	85
Average	$ .86	$2.34	$1.96	$ .78	$6.17	-
8	1.25	4/	1.55	.95	3.75	85-90
9	1.25	4/	1.45	.20	2.90	85-90
10	1.00	4/	1.25	.25	2.50	85-90
Average	$1.17	-	$1.42	$ .47	$3.05	-
Average 5/	$1.07	$2.34	$1.80	$ .68	$5.32	-

1/ The basis for comparison is high calcium limestone. How quickly this material corrects soil acidity depends largely on fineness which must meet specific requirements. Other factors such as soil and climatic conditions also are involved.

2/ Information not available.

3/ Association used two sources.

4/ No freight involved.

5/ Averages were derived from all prices used by the 10 associations.

Table 4. - Delivering and spreading charges per ton to patrons, 10 selected farm supply cooperatives, Kentucky, Mississippi, and Tennessee, 1958 1/

Association number	Rates charged by cooperatives			Rates charged by contract truckers		
	Delivering	Spreading	Delivering and spreading	Delivering	Spreading	Delivering and spreading
				Per ton		
2	-	-	-	-	-	$2.25
3	$1.00	$0.75	$1.75	-	-	-
4	-	-	-			2.00
5	-	-	$2.00	-	-	-
6	-	-	-			2.00
7	-	-	-	$1.00	$0.75	1.75
8	-	-	-	0.75	0.80	1.55
9	-	-	-	0.95	0.50	1.45
10	-	-	-	0.75	0.50	1.25
Average	$1.00	$0.75	$1.88	$0.86	$0.64	$1.75

1/ A breakdown of charges was not available for association number 1.
2/ Includes both delivering to farm and spreading.

OUTLOOK

Cooperative managers should have a good idea of the needs of their patrons and know what to expect from them if they are to plan effectively. All business managers must do some projecting in order to make successful future plans. Large business corporations hire economic experts to aid in future planning but relatively small cooperative businesses cannot afford this service. Therefore, local cooperative managers must do their own projecting. Efficient managers must become adept at anticipating the future needs of their farmer patrons.

Future Supply and Service

All 10 association managers reported sufficient lime producing facilities available to them to meet forseeable future needs. Associations not presently stockpiling lime indicated a possible future need for this method of operation in order to have enough lime on hand to meet the heavy demand in busy seasons. Three managers believed a definite need for stockpiling would occur in the future as farmers become better educated in lime use and, consequently, more aware of the need for applying lime to deficient soils.

Nine managers expected no change in liming services available from other firms in their areas and one believed only slight change might occur.

Future Use By Farmers

Opinions of managers of the 10 selected farm supply cooperatives regarding future use of lime by farmers in their respective areas were as follows:

Opinions regarding lime use	Number of managers expressing opinion
No change expected	1
Use will depend largely on assistance farmers get through ASC program	6
Farmers will use more as they become better educated in use of lime	3
Total	10

Future Plans of Cooperatives

Plans of the 10 associations, as expressed by managers, in regard to future lime services were as follows:

Future plans	Number of managers expressing plans
Continue along present lines	6
No change as long as we can get satisfactory trucking service	2
Now own spreader trucks; plan to buy more equipment in future for greater efficiency and better service to patrons	1
Now contracting with truckers; plan to buy own equipment to give patrons better service	1
Total	10

The six managers who expressed plans to continue as they were presently operating indicated that they were not sure what they would do if trucking facilities were to become unavailable. At the time of the study they did not believe that their association could afford the necessary capital to purchase spreading and loading equipment. Two managers thought it would be necessary to purchase equipment to serve patrons if no contract truckers were available, even though they did not believe it would be profitable for their association. One association planned to buy additional equipment and the remaining one planed to buy its own spreading equipment. Its management believed it can realize savings on a cooperatively owned liming operation and at the same time give its patrons a better service than available to them at present.

APPENDIX

A study of bulk distribution of fertilizer and lime in the Northeast was published in 1956. [1] The study was based on experience of affiliates of Cooperative G.L.F. Exchange, Inc., Ithaca, N. Y. The purpose of the report was to provide information on equipment, operating practices, costs, and other factors pertaining to the G.L.F. bulk distribution program.

The G.L.F. retail stores owned their liming equipment and maintained separate records on liming operations. This made possible a more accurate and useful economic analysis. In this study of 10 associations in Kentucky, Mississippi, and Tennessee, 7 contracted with private truckers to deliver and spread lime for patrons; therefore, records on direct truck expenses, wages, and other expenses were not available. Thus, a comparison of operating expenses could not be made. However, the information on various types of G.L.F. operations shown in appendix table 1 should be beneficial to cooperatives in other area engaged in bulk lime distribution. Also appendix table 2 shows the importance of volume per truck at G.L.F. service stores having local stockpile operations. A decrease in expense dollars a ton, and an increase in expense dollars a truck would also be expected for other types of operations

Appendix table 3 was entered in this report to facilitate comparisons of the charges involved in lime distribution in the G.L.F. service area with the charges reported in this study in table 6.

Sufficient evidence is not presented to determine whether contracting for or owning liming equipment is most economical. Also, a choice for cooperatives in all areas does not exist. However, there should be sufficient evidence in this report to stimulate more thought on the economies of lime distribution among associations now owning expensive equipment and those considering buying in the future.

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[1] Trotter, Warren K. Bulk Distribution of Fertilizer and Lime in the Northeast, Farmer Cooperative Service, U. S. Department of Agriculture, General Report 24, September 1956.

Appendix table 1. - Per ton costs of spreading lime at G.L.F. service stores and average tons spread per truck, 1953-54 and 1954-55

Item	Direct plant to farm		Field spreader type		Local stockpiles		Combination stockpile and direct plant to farm	
	1953-54	1954-55	1953-54	1954-55	1953-54	1954-55	1953-54	1954-55
Number of stores	15	17	11	10	24	23	4	6
Number of trucks	18	19	14	14	27	26	5	8
Average tons a truck	3,055	2,874	2,913	3,022	2,729	3,622	3,999	2,612
Expenses a ton:								
Wages	$0.74	$0.77	$0.50	$0.45	$0.57	$0.56	$0.85	$0.91
Depreciation	.69	.75	.44	.42	.77	.73	.65	.72
Direct truck expenses:								
Gasoline	.34	.35	.16	.15	.23	.21	.32	.32
Repairs, oil, lubrication	.43	.46	.34	.29	.25	.35	.56	.46
Tires and tubes	.10	.16	.06	.05	.07	.08	.16	.04
Total direct truck expense	.87	.97	.56	.49	.55	.64	1.04	.82
Other expenses:								
Management fee	.10	.10	.10	.10	.10	.10	.10	.09
Insurance and license	.15	.15	.10	.10	.14	.12	.14	.14
Interest	.09	.09	.03	.04	.10	.09	.10	.07
Miscellaneous	.01	.01	.01	1/	.01	.02	.01	1/
Total other expense	.35	.35	.24	.24	.35	.33	.35	.30
Total expense	2.65	2.84	1.74	1.60	2.24	2.26	2.89	2.75

1/ Less than 0.005.

Source: Trotter, Warren K. Bulk Distribution of Fertilizer and Lime in the Northeast, Farmer Cooperative Service, U.S. Department of Agriculture, General Report 24, September 1956.

Appendix table 2. - Revenue, expense and net margin per ton of lime spread per truck at G.L.F. service stores having local stockpile operations, 1953-54 and 1954-55

Amount spread per truck	Revenue	Expense	Net margin	Revenue	Expense	Net margin	Percent net margin was of revenue
	Per ton			Per truck			
Under 3,000 tons:							
1953-54	$3.21	$2.79	$0.42	$6,838	$5,952	$ 886	13.0
1954-55	3.13	2.92	.21	7,357	6,871	486	6.6
3,000 to 3,999 tons:							
1953-54	2.94	2.29	.65	11,212	8,712	2,500	22.3
1954-55	2.61	2.18	.43	9,547	7,969	1,578	16.5
4,000 tons and over:							
1954-54	2.79	1.81	.98	13,341	8,628	4,713	35.3
1954-55	2.90	2.05	.85	13,637	9,628	4,009	29.4
All operations:							
1953-54 (2,729 tons)	2.93	2.24	.69	7,994	6,105	1,889	23.6
1954-55 (3,622 tons)	2.84	2.26	.58	10,289	8,205	2,084	20.3

Source: Trotter, Warren K. Bulk Distribution of Fertilizer and Lime in the Northeast, Farmer Cooperative Service, U.S. Department of Agriculture, General Report 24, September 1956, P,32.

Appendix table 3. - Schedule of per ton charges for lime, and lime trucking and spreading by 10 G.L.F. retail stores, spring, 1955

Store code and type of operation [1]	Price f.o.b. plant	Price delivered by rail	Unloading	Trucking to farm	Spreading	Trucking and spreading	Store margin	Total cost to patrons
				Per ton				
1 - T	$3.00	-	-	-	-	$3.50	$0.75	$7.25
2 - T	3.00	-	-	$2.00	$1.25	3.25	.50	6.75
3 - F	3.00	-	-	2.40	1.70	4.10	.65	7.50
4 - F	1.35	-	-	2.50	2.80	5.30	.35	7.00
5 - F	2.75	-	-	2.80	2.00	4.80	.70	8.25
6 - S	-	$4.70	$0.30	-	-	3.00	.50	8.50
7 - S	-	4.25	.25	-	-	3.00	.50	8.00
8 - S	-	4.78	.32	1.50	1.25	2.75	.35	8.20
9 - S	-	4.78	-	-	-	2.80	.46	8.04
10 - C	3.00	-	-	1.90	2.00	3.90	.35	7.25
Average	$2.68	$4.63	$ .29	$2.18	$1.83	$3.64	$ .51	$7.67

Source: Trotter, Warren K., Bulk Distribution of Fertilizer and Lime in the Northeast, Farmer Cooperative Service, U.S. Department of Agriculture, General Report 24, September 1956, P,17.

[1] Trucked direct from plant to farm, F - Field spreading, S - local stockpile, and C - combination of direct plant-to-farm and stockpile.